

## 19.

Growth of Galápagos Tortoises, *Testudo vicina*, from 1928 to 1937.

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(Plate I).

The colonies of Galápagos tortoises (*Testudo vicina*) established by the writer under the auspices of the New York Zoological Society may be reported as in prosperous condition. The tortoises are now in eight groups. Those within the limits of the United States were originally a little more widely distributed.

During the nine years they have been under our observation, the animals have made notable growth. When distributed for observation in 1928, the average weight of the 100 tortoises considered in this paper was a little more than 18 pounds. At present it is more than 134 pounds. A dozen individuals weigh nearly 200 pounds each, and a score weigh more than 160 pounds.

In the table showing growth we have not included all the tortoises originally reported upon (see *Zoologica*, Vol. IX, No. 13; June 1, 1931). A few lost the copper numbers used to identify them, and a few are temporarily out of reach. The 100 herein reported upon have individual records without error.

TABLE I.

Growth of *Testudo vicina* at all stations.

Place.	Number of Tortoises.	Total lbs., 1928.	Average lbs., 1928.	Total lbs., 1937.	Average lbs., 1937.
San Diego, Cal.	18	425	23.61	2,492	138.44
San Antonio, Tex.	7	99	14.14	1,078	154.00
Houston, Tex.	8	72	9.00	1,312	164.00
New Orleans, La.	7	100	14.28	1,010	144.28
N. Miami, Fla.	39	908	23.28	5,305	136.02
Bermuda	9	56	6.22	864	96.00
Honolulu, T. H.	6	177	29.50	1,129	188.16
Sydney, Australia	6	19	3.16	306	51.00
	100	1,856		13,496	

Being widely scattered, the tortoises have not all been treated alike. Their food has varied somewhat from place to place, and some have still to be housed in winter. There were losses from feeding vegetables on sandy ground, post-mortem examinations showing sand impacted in the colon.

The following records made at Houston, Texas, for the years 1928 and 1936 show the growth in dimensions as well as weight.

TABLE II.

Increase in dimensions and weight of eight *Testudo vicina* at Houston, Texas, between 1928 and 1936.

1928.

No.	Length, Inches.		Width, Inches.		Height, Inches.	Weight, lbs. 1928.
	Straight.	Curved.	Straight.	Curved.		
90	13 $\frac{1}{8}$	17 $\frac{1}{2}$	11	17 $\frac{1}{4}$	7 $\frac{1}{4}$	13
91	12 $\frac{1}{2}$	15 $\frac{3}{4}$	9 $\frac{1}{2}$	14 $\frac{5}{8}$	5 $\frac{7}{8}$	10
92	11 $\frac{1}{8}$	14 $\frac{1}{2}$	8 $\frac{1}{2}$	13 $\frac{1}{4}$	5 $\frac{1}{4}$	7
93	12	15 $\frac{3}{4}$	9 $\frac{1}{4}$	14 $\frac{3}{4}$	6	8
94	11 $\frac{3}{4}$	14 $\frac{5}{8}$	8 $\frac{7}{8}$	14	5 $\frac{5}{8}$	7
95	12 $\frac{1}{4}$	15 $\frac{1}{2}$	9 $\frac{1}{2}$	15	6	10
98	10 $\frac{3}{4}$	13 $\frac{1}{2}$	8 $\frac{1}{2}$	13	5 $\frac{1}{8}$	7
99	12 $\frac{1}{2}$	15 $\frac{3}{4}$	9 $\frac{5}{8}$	15 $\frac{1}{4}$	6 $\frac{1}{8}$	10
						72

1936.

No.	Length, Inches.		Width, Inches.		Height, Inches.	Weight, lbs. 1936.
	Straight.	Curved.	Straight.	Curved.		
90	25	40	27	40	20	179
91	24	38	24	40	20	154
92	23	35	21	38	19	150
93	23	35 $\frac{1}{2}$	22	38	19	149
94	23 $\frac{1}{2}$	37	22 $\frac{1}{2}$	39 $\frac{1}{2}$	19 $\frac{3}{4}$	162
95	24	38	24	38	19	155
98	24	41	26	42	21	183
99	25	40	24	41	20 $\frac{1}{2}$	180
						1,312

The tortoises housed in winter, and uniformly dark-colored, developed very rapidly a conspicuous white growth-ring on the border of each horny plate when turned out on grass. This treatment produced a new ring each year, indicating age; growth slow in winter, rapid in summer. Tortoises in southern Florida, having access to grassy ranges at all times, were never lacking a very faint whitish ring. However, tortoises of similar size and weight had equal numbers of rings, regardless of treatment. For photographs of growth rings, see *Zoologica*, Vol. IX, No. 13, page 469.

The horny plates of the tortoises expand with the growth of the animal, by adding rings of new material around their margins.

In the younger animals, at least, age is indicated by number of rings. In tortoises of large size the rings tend to flatten and are hard to count. At-

tempts at counting rings on tortoises exceeding 160 pounds in weight indicate that they are about 20 years old. All males of that size or a little over have within the past three years partly acquired the concave plastron that *must* precede breeding age. This hollowing out is still increasing and we assume that maturity is near. Giant tortoises are long-lived. There are records of a few that exceeded 150 years. The breeding age may not be attained until they are between 20 and 25 years old.

## EXPLANATION OF THE PLATE.

## PLATE I.

Fig. 1. *Testudo vicina*. Specimen No. 10 at North Miami, Florida. Weight, 165 pounds. As nearly as can be judged by ring growth, this tortoise is about 20 years old and the hollowing of the plastron, indicating an approach to breeding age, is quite noticeable.